CLAIMS

WHAT IS CLAIMED IS:

1. A method for treating fatty acids comprising: adding iodine to a fatty acid, which contains polyunsaturated components, to form a mixture; heating said mixture to cause conjugation of said polyunsaturated components; further reacting said mixture under heat with the addition of a material to cause polymerization of the conjugated polyunsaturated components to produce a composition containing linoleic dimer/trimer acids and oleic acid.

2. The method according to Claim 1, wherein said fatty acid includes monounsaturated components such as oleic acid, oleic acid isomers and non-conjugated linoleic acid.

3. The method according to Claim 1, wherein said fatty acid is selected from the group consisting of tall oil fatty acids, vegetable fatty acids, animal fatty acids and marine fatty acids.

4. The method according to Claim 1, wherein said iodine is added in amounts ranging from 0.01 to 0.15% by weight of the fatty acid.

5. The method according to Claim 1, wherein a co-catalyst is further added to the mixture to enhance the conjugation of said polyunsaturates.

6. The method according to Claim 5, wherein said co-catalyst is selected from the group consisting of iron complexes or iron powder.

7. The method according to Claim 6, wherein the co-catalyst is iron(III) chloride added in the range of 0.015 to 0.1% by weight of the fatty acid.

8. The method according to Claim 6, wherein the co-catalyst is iron powder added in the range of 0.01 to 0.1% by weight of the fatty acid.

9. The method according to Claim 1, wherein said mixture is first heated to temperatures in the range of 200 to 260°C for up to 6 hours.

10. The method according to Claim 1, wherein said material added to cause polymerization is a clay catalyst present in an amount of 1 to 4.7% by weight of the fatty acid.

11. The method according to Claim 10, wherein said mixture is further reacted under pressure up to 55 PSI and at temperatures in the range of 170 to 190°C for up to 6 hours.

12. The method according to Claim 1, wherein said material added to cause polymerization is t-butyl peroxide present in stoichiometric amounts to said polyunsaturated components.

13. The method according to Claim 12, wherein said mixture is further reacted at temperatures in the range of 120 to 135°C for up to 8 hours.

14. The method according to Claim 1, wherein a catalyst is further added to said material to enhance polymerization of said conjugated polyunsaturated components.

15. The method according to Claim 1, wherein said catalyst is lithium carbonate added in amounts between 0.1 to 0.15% by weight of the fatty acid.

16. The method according to Claim 1, wherein after said polymerization, said mixture is cooled to at least 130°C.

17. The method according to Claim 1, wherein phosphoric acid and diatomaceous earth elements are added to said cooled mixture and is then filtered.

18. The method according to Claim 1, wherein said oleic acid and linoleic dimer/trimer acids are separated from said composition using conventional separation techniques.

19. The method according to Claim 18, wherein said separation techniques included thin film evaporator or distillation columns.

20. The method according to Claim 1 wherein, based on the weight of the starting materials, at least 50% or more oleic acid is isolated.

21. Oleic acid formed by the method according to Claim 1, wherein the oleic acid has an iodine value in the range of 80 to 100.

22. Lineloic dimer/trimer acid formed by the method according to Claim 1.

23. A process for isolating oleic acid and producing linoleic acid-based dimer/trimer acids comprising: conjugating polyunsaturated

components of fatty acids in the presence of monounsaturated components; and selectively polymerizing said polyunsaturated components to produce the linoleic acid-based dimer/trimer acids.

24. The method according to Claim 23, wherein said monounsaturated components included oleic acid, oleic acid isomers and non-conjugated linoleic acid.

25. The method according to Claim 23, comprising the further step of separating the linoleic acid-based dimer/trimer acids.

26. The method according to Claim 23, comprising the further step of isolating the oleic acid.